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ABSTRACT

This program, included in "Effective Reading Programs...," is designed to minimize initial difficulties in learning to read, to control early reading and word attack habits, and to meet a wide range of individual differences. Begun in 1966, the program serves an unselected cross-section of children in 110 kindergarten through third-grade classrooms in St. Paul, Minnesota, and is also used in other selected cities. In addition to readers, the reading program includes programed texts, reading and listening tests, letter forms, and linguistically related words. To prevent children from developing habits of using inappropriate cues in identifying words, the program uses a system of controlled word groupings to focus the child's attention on individual letters rather than on word length or configuration. Linguistic word groupings, programed texts with story-related pictures, and early attention to context clues are also combined in the series to meet the needs of children with different learning styles. A detailed teacher's manual eliminates the need for inservice or preservice training for the program. (TO/AIR)

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THE VISUAL LINGUISTIC READING PROGRAM: RATIONALE AND EVALUATION

By

James I. Brown

CS 001 936

THE VISUAL LINGUISTIC READING PROGRAM:

RATIONALE AND EVALUATION

PART I

THE RATIONALE OF A NEW VISUAL LINGUISTIC APPROACH

The entire January, 1967, issue of the Phi Delta Kappan focuses attention on the imminent impact on education of big business and emerging technology. According to the editor, the issue is intended to prepare educational leaders--intellectually, institutionally, and politically--to take full advantage of this new opportunity to improve education. In it, there is discussion of such things as computer-assisted instruction, man-machine systems, teaching machines, talking typewriters, video tape, and closed-circuit television.

Within this challenging framework suppose we examine the make-up of the new Visual-Linguistic Basic Reading Series, essentially a systems approach, capitalizing on the C-O-T technological advances--Copy machine, Overhead Projector, and Transparencies.

While this Series has the usual readers--five for first grade use--in other respects, with Word-Introducers, Story-Introducers, Programed Texts, and Reading and Listening Tests, it is unique. The Word- and Story-Introducers, in packet form, are for making transparencies for the overhead projector and have a wide variety of uses. Whenever possible, each new word introduced has a corresponding picture to illustrate its meaning. Each story is also introduced by a full-size picture to stimulate added interest in the reading to follow. Finally, the Programed Texts--four of them--provide added reinforcing for the words and sounds being learned.

As for rationale, the series is built around four major convictions--that a strong reading program should 1) minimize the initial difficulties in learning

to read, 2) control the early formation of desired reading and work attack habits, 3) meet a wide range of individual differences, and 4) heighten the teacher's effectiveness and position.

Minimizing Initial Difficulties

The first major consideration was to minimize, in as far as possible, the initial difficulties in learning to read. It was felt that initial success, more than anything else, would give added impetus to the pupil's efforts and result in maximum progress.

Unfortunately the chief difficulty seems to be the English language itself. The beginning reader is faced, for example, with the problem of learning as many as six different pronunciations of the single letter a,--as in bat, mate, father, panda, ball, and any. He is faced also with many different spellings of a single sound, as with the long a sound, as in break, they, fail, day, veil, goal, gauge, and eh. Such irregularities pose major learning difficulties.

Some way of imposing more order initially to minimize these troublesome variations should facilitate the early efforts markedly. i/t/a attempts to do this through the use of a specially devised alphabet where each letter has one and only one sound. Twenty entirely new symbols are added to 24 conventional letters, making a total of 44 letters to represent 44 sounds. Still another approach is to use diacritical markings on the conventional alphabet, as most dictionary makers do to indicate pronunciation. Both systems establish an orderly one-for-one relationship between letter and sound. But normal print is neither i/t/a nor diacritically marked. And it is normal traditional orthography that the child must learn to cope with.

In this series, the desired one-for-one relationship was achieved in a different way--using what might be called initial letter values. The words introduced initially were words in which all letters had one and only one sound. This eliminated the need of learning extra symbols or markings and had the advantage of keeping within the natural framework of English orthography.

This necessitated a somewhat different way of thinking. Instead of thinking in terms of the repetition of words, the emphasis was now on the repetition of letter-sound values. Research on retroactive inhibition as well as the recent research by Skinner on extinction points up the crucial nature of this kind of structuring for peak learning efficiency.

For example, the first book of the Series, Alphy's Cat, introduces 56 different words with the short regular a, each word being used at least two times in the story where it is introduced. The important figure, however, is not the number of times any given word is repeated but the number of times the short a sound is repeated. In the 1,325 words used in the first book, short a is repeated 717 times. Add to that figure the repetitions from the related Word- and Story-Introducers, tests, and programmed text and the short a is repeated 1,787 times. In this respect the series is unique.

This repetition is intended to facilitate and reinforce a single value for a before other values are taught. Of the sixty words introduced in Alphy's Cat, all but four have the short a sound. Obviously this approach gives the beginning reader as simple a task as possible for the initial efforts.

Once all the regular initial letter values are taught, with sufficient repetitions to make for solid learning, a second step is built into the series. This was to simplify the task of moving the pupil into supplementary materials and to facilitate his eventual handling of all the irregularities present in the language.

Research involving an analysis of 42 pre-primers and 28 primers, the vocabulary of seven primary reading series, and words of highest frequency from four other sources was used in selecting the irregular sight words to be introduced. This was to insure as close a relationship as possible to other printed materials used at the first grade level. It seemed desirable, once basic patterns were learned, to facilitate the move into a variety of supplementary books.

In these three ways--by establishing simple one-to-one letter sound relationships, by providing extensive reinforcement of those relationships, and by introducing as sight words those most likely to be met in other material at this level--an attempt was made to minimize difficulties.

Controlling Habit Formation

A second major consideration in shaping the program was that of controlling the initial steps with sufficient care to build desirable habits from the very beginning. Every experienced teacher of reading has struggled to correct bad habits that seriously impede a child's progress. These undesirable habits stem largely from the number of extraneous cues that may for a time serve as a basis for successful word discrimination.

For example, if the first words taught happen to be of different length, length automatically tends to become the ingrained basis for subsequent word discrimination. Dr. Arthur Gates mentions that when children were given the words, cow, postman, dress, duck, football, and dandelion, length was the most obvious basis for discrimination and the children relied on length for accurate differentiation.

If words of the same length are taught together, pupils are led to lean on other cues--usually some outstanding detail, "as the dot over the i in pig or the 'funny cross' in box, the similar beginning and ending in window,

and the monkey's tail on the y in monkey," to cite examples given by Gates.

Sometimes a child pays no attention to the word at all. but relies on pure memory for a word, phrase, or entire sentence. One look at a picture, a certain kind of print, or even a spot or smudge and the child has the necessary cue to "read." Durrell tells of a child who read the word children on a flash card but could not read it in a book, insisting he had never seen the word before. When shown the flash card again and asked how he knew the word was children, he pointed to the corner and said, "By the smudge."

Just as the best research demands careful control of all important variables, so it would seem that the best initial reading instruction would demand equally careful control of the child's first learning experiences. Control of the first words taught would seem particularly important since those words play the key role in habit formation.

If they happen to be words of different length, the child is thereby encouraged to depend on length differences. The initial success reinforces and sets such a dependence. But as the child meets more words, he becomes confused and frustrated because length cues are no longer effective. This suggests the desirability of starting with words of the same length, to keep the beginner from developing an initial reliance on an undependable cue.

While this is a step in the right direction, notice the new problem arising. Suppose that pig, box, and man are taught together--all words of the same length. This grouping tends to lead the child to look for a salient detail, perhaps the dot over the i in pig, the funny x at the end of box, or the two humps in the first letter of man. But dependence on such details also leads to confusion and frustration. They are no help later on, when he must discriminate between pig and big, box and fox, man and men.

Additional controls are needed to build habits of reliance on the most dependable of cues--letter cues, those which can be counted on for most effective word discriminations. For example, if am, at, and an are introduced as a group, obviously length is not going to be very helpful, and since all three begin with the same letter, the child must look at the last letter in each word since that is the only difference, the only basis upon which an accurate discrimination may be made. This kind of controlled word grouping forces more attention on letters, a step in building desired habits.

Notice, however, that such a word grouping forces attention on the last letter of a word. One other matter of particular concern should be built into those first discriminations, based on letter differences--the establishing of strong, positive left-right orientation so important in reading. When salient details are used for cues or when certain letters tend to stand out, unless there is sufficient control, attention is sometimes drawn to the first, sometimes to the middle and sometimes to the end of a word. This tends to keep the child from any particular orientation, and fails to establish the desired left-right orientation.

For that reason, the early word groupings in this Series are such as to demand attention to the first letter, not the middle or last. For example, when bat, rat, mat, cat, and sat are introduced as a group, the child must depend on the first letter for his discriminations. The second and third letters are identical. The initial success in those first discriminations, then, reinforces right habits--a left-right orientation as well as a reliance on letters.

When, through chance initial success, a child builds a reliance on extraneous and undependable cues, teacher and child face two problems, not one--first, the problem of breaking a bad habit, second, the problem of

building a right habit to replace it. With sufficient control, however, it should be possible to build right habits from the very start to ensure more rapid progress and less frustration and re-teaching.

Providing for Individual Differences

The third basic consideration was that of providing for a wide range of individual differences. The one generalization most frequently made from the extensive U.S. Department of Education First Grade Studies was that "there is no one method of teaching reading." An approach that is best for one student is apparently not always best for another. Some children are more eye-minded than ear-minded; children differ widely in background and interests. In short, a wide variety of individual differences do exist. How best provide for them?

In this series, an eclectic fusing of five different facets was decided upon in an attempt to deal with such differences--the visual, the linguistic, the programed, the auditory, and the contextual.

Visual. Technological advances in overhead projectors, copy machines, and transparency materials have made possible for the first time a truly visual approach for teaching the visual act of reading. In this Series at the first grade level the alphabet and Word- and Story-Introducers alone provide the teachers and beginning pupils with well over a thousand pictures to facilitate the meaningful fusing of auditory and visual word symbols.

Linguistic. The word groupings characteristic of the linguistic approach accorded best with the other considerations underlying the series. The ordering of word groups was governed in part by previously mentioned considerations, in part by linguistic considerations designed to facilitate the child's attempt to connect spoken words with their corresponding written forms. When a picture is used to elicit the desired spoken word, the child is thus prepared

for the next step--the fusing of spoken and written form. In this way the pictures serve to facilitate the connections to be made.

Some research by King and Siegmar on different sensory clues as aids indicate that "when words were similar, a picture accompanying the printed words aided in learning it." Weintraub, in commenting on this research, writes, "Their findings may have implications for those linguistic programs emphasizing similar spelling patterns. In such programs the words are similar, and illustrations of the words would serve perhaps as an aid in learning rather than as a distracting element."

Furthermore, the linguist's interest in structure, pattern, and intonation is reflected in suggested classroom activities relative to both Word- and Story-Introducers.

Programed. A programed format is used as part of this series, not to introduce words, but to reinforce both form and meaning. This cuts down measurably on the number of frames needed, and, hopefully, results in less possibility of fatigue and loss of interest.

After the stories in the reader are read, the child then turns to his programed test where all the words are used again at least once--both basic and growth words. This puts the words into a different framework and moves the children a step further into more independent effort, a move more easily made with a strong background already established.

Only in this part of the program are story-related pictures used with reading matter. Here the picture is neither directly above or below the line of print related to it, a fact which minimizes undesirable up-down eye movements. Also, whenever possible, a story thread is used to heighten interest and insure the growth of meaning. Some frames are, in addition, specially designed to facilitate improved word-attack habits, focusing attention on word beginnings or endings.

Auditory. Since it is through the listening channel that children acquire the initial vocabulary that they bring with them to the first grade, and since that channel is for them the most natural and effective, this Series attempts to structure the early learning efforts in reading with this in mind.

Contextual. Context is the larger pattern which imposes meaning on words. Efforts are made to start the children to develop an awareness of its importance in the very early lessons. Contextual cues, when added to word and letter cues, insure attention to all cues of prime importance in the reading situation.

As can be seen, these five strands, taken together, form a strong language-arts emphasis, with writing, speaking, and listening running parallel with the reading activities.

Enhancing Teacher Effectiveness

The fourth and most important consideration of all is that of enhancing the teacher's effectiveness. The two variables of chief concern in evaluating a reading program are the teacher and the material. Differing opinions exist, however, as to their relative importance. For example, Dr. Durrell, commenting on the U.S. Office of Education First Grade Reading Studies, said, "It is evident from these studies that reading achievement is 4/5ths teacher and 1/5th material." At the other extreme is the position held by Dr. Montessori that "things are the best teachers."

This dichotomy between teacher and material is understandable. The conventional readers, workbooks, recordings, film strips, and movies fall neatly into such a classification. By and large they are in a format that imposes certain limits. Books are bound, the pages following a set order; the same words and pictures are always on the same page. Movies, film strips,

and recordings also come in a fixed sequence and cannot be re-ordered by the teacher, even if she wished to move one scene in a film to an earlier position to achieve a different educational objective.

Every teacher worthy of the name has certainly chaffed under such limitations in her attempts to fit material more closely to the immediate classroom situation or individual problems at hand. All too often with this kind of material the teacher must ask, how can I best fit my pupils to the material. But ideally, materials should be fitted to pupils, not pupils to the materials.

THE VISUAL LINGUISTIC READING PROGRAM:

RATIONALE AND EVALUATION

PART II

EVALUATING A VISUAL-LINGUISTIC, MULTI-MEDIA

APPROACH TO PRIMARY READING.

It may come as a surprise to note that of the 27 first grade reading studies sponsored by the U.S. Office of Education in 1964-65, only one had the word visual in its title--"Evaluation of Levels-Designed Visual-Auditory and Related Writing Methods of Reading Instruction in First Grade." In this study, as the title indicates, the visual component is not isolated and explored separately. In fact the initial paragraph describing the Visual-Auditory method does not once use the word visual. Obviously even in the one study most concerned with the visual, that element is still not accorded predominant attention. Yet reading is a visual act--the perceiving and comprehending of print. For that reason the visual dimension would seem to deserve particular attention and application if optimal help is to be provided for beginning readers.

But, important as any one element might seem, Dr. Russell G. Stauffer's comment in the October, 1966, issue of The Reading Teacher should be remembered. In his editorial discussing the various methods for teaching reading in the U.S. Office of Education First Grade Studies he writes, "regardless of the criterion used there is no one method."

With eclecticism as the guiding principle, the Visual-Linguistic Reading Program was built on a combination of methods and not on one only. Just as

plant breeders have taken the best characteristics from several strains to develop superior varieties, so, in this program, five separate elements were fused to form a distinctly new approach. The program is intended to be more strongly oriented toward visual and linguistic elements than any other program yet devised for the teaching of reading. In addition, three other elements play an important role, making a total of five major components--1) the Visual, 2) the Linguistic, 3) the Contextual, 4) the Listening, and 5) the Programmed.

A program this different from the usual should, ideally, receive more intensive and extensive field and statistical testing than other programs. Fortunately the publishers were willing to provide just that--not one but two years of testing in three widely separated geographic locations--public school systems in St. Paul, Minnesota; Tampa, Florida, and La Mesa, California. The present evaluation is based on data collected from those two test years, 1966-67 and 1967-68.

The initial statistical testing during the 1966-67 school year was under the direction of the Supervisor of Reading and Special Learning Disabilities for the St. Paul Public Schools. The research design was structured to check the relative effectiveness of the Visual-Linguistic Program as well as to isolate and check the importance of the visual strand. Toward that end a three-fold grouping was used. Group A used the Visual-Linguistic Program, which incorporated frequent and carefully structured use of transparencies and the overhead projector. Group B used the regular basal reading program found in the school system but with an overhead projector to add a strong visual dimension. As a control, Group C also used the regular reading program but with no overhead projector available.

In the fall of 1966 approximately 1,800 children from the three test centers were placed in one of the three experimental or control groups and given the Metropolitan Reading Readiness Test, followed in January, 1967, by Form X of the Stanford Achievement Test, and in May, 1967, by Form W of the same test. The study ran for approximately 140 days, following the pattern established by the United States Office of Education Studies on First Grade Reading Programs.

Based on the data collected during the first test year, comparisons were made using the adjusted mean scores for each of the six subtests of the Stanford Achievement Test in each of the three schools, 18 subtest scores in all. By midyear, the Visual-Linguistic Group (A) scored best in 6 of the 18 subtests, the overhead projector group (B) in 9 of the 18, and the regular program (C) in 3 of the 18. Differences at this point were, however, not significant.

The end of the year testing did reveal statistically significant differences--at the 5 per cent level or less ($P < .05$). The Visual-Linguistic group (A) out-scored to a significant degree the other two groups in 5 out of 18 subtests, the overhead control group (B) scored significantly above the other two groups in 7 out of 18 subtests. The basal reading control group (C) scored significantly above the overhead projector group in only 1 out of 18 subtests and above the Visual-Linguistic group in no subtests. Other differences were not statistically significant.

The comparisons between the basal reading groups, B and C, where the only difference was between using or not using the overhead projector, provided statistically significant evidence of the importance of the visual element, one of the two matters of primary concern in this study. The findings also provided pertinent evidence for justifying the strong emphasis on the visual factor in the Visual-Linguistic program. Despite the fact that the

totally new Visual-Linguistic program demanded major adjustments on the part of the teachers, results were still significantly better than those in the regular basal programs, which involved no change from the usual teaching pattern.

In addition to the statistical checking, use was made of teacher ratings--scales designed to reveal more clearly the strengths and weaknesses in need of possible attention before the second year of testing. A five-point rating scale was used, with two positive ratings--Superior and Good, one neutral rating--Average or the same as other programs, and two negative ratings--Poor and Inferior, plus Not Answered.

The mid-year check showed 52.7 per cent of the teachers rated the program positively, 16.8 per cent neutrally, 23.2 per cent negatively, 7.2 per cent not answering. Of the 15 areas surveyed, the lowest rating was given the teacher's manuals, no teacher rating them superior to those used before and 44 per cent rating them inferior. Immediate steps were taken to re-work the teacher's manuals completely.

The more complete ratings at the end of the year covered 22 areas and showed 61.2 per cent positive ratings, 24.4 neutral, 11.5 negative, and 2.7 not answering. While the end-of-the-year ratings still gave the teacher's manuals the lowest rating, only 18.1 per cent gave them the lowest rating--Inferior, as compared with 44.4 per cent at midyear, a noticeable improvement when all the manuals had been used.

In answering the question, "How well does the Visual-Linguistic Reading Series seem to work with the superior student?" 90.9 per cent of the teachers gave it the top rating--superior to other materials. The characters around which the series is built--Alphy, Canny Cat, Babby Big-Ear and Bob were, according to the ratings, characters the pupils related to extremely well,

being rated superior by 31 to 77 per cent of the teachers.

Teacher ratings and results from the statistical check provided exactly the guidance needed in making revisions to strengthen the program before the second year of testing, which for 1967-68 was conducted by the Test Department of Harcourt, Brace and World, Inc.

The same three schools were used, a total of 1,044 pupils being tested--three groups of 348 pupils, matched across groups in terms of their general mental ability and readiness of reading instruction. The Stanford Achievement Batteries, Form W, were used, the subtest on Arithmetic being omitted in the comparisons since this is out of the area of reading and differences between treatment for that subtest were not significant.

For the second year of statistical testing, high, middle and low ability groups instead of geographic differences were studied along with the same three-fold experimental and control variables. Each of the three groups of 348 pupils were divided into three cells of 116 pupils each of high, middle, or low abilities. This meant 45 subtests, the 5 subtests dealing with reading for each ability grouping at each treatment.

Pupils, in class units, were presumably assigned at random to one of the three treatment groups. Analysis of pre-test measures raised some doubt about the randomness of the assignment, thus necessitating some adjustments in the data. It was intended that all pupils in the research program should take three tests: Metropolitan Readiness Test (MRT), 1966 Ed., Form A; Otis-Lennon Mental Ability Test (OLMAT), Primary II, Form J, 1967 Ed.; and Stanford Achievement Test, Primary I, Form W, 1964 Ed., including the following subtests: (1) Word Reading, (2) Paragraph Meaning, (3) Vocabulary, (4) Spelling, (5) Word Study Skills, (6) Arithmetic. MRT and OLMAT were taken in September, 1967, and Standord in May, 1968.

Before the data were analyzed, two adjustments in number of pupils were made. First, all incomplete cases were eliminated. An incomplete case was defined as one for which one or more of the eight test scores (MRT, OLMAT, and 6 Stanford scores) were missing; or for which there was not adequate information to determine whether the pupils belonged to Group A, B, or C for the entire academic year. Some switching of pupils or teachers from one class to another during the year made such determination impossible in some instances.

The second adjustment involved a pre-test matching operation. Preliminary analysis of the data made it apparent that pupils in Group A were noticeably superior to pupils in Groups B and C and pupils in Group B were slightly superior to pupils in Group C in MRT and OLMAT scores. Therefore, pupils in the three groups were matched on the pre-test scores. It was decided that the most effective pre-test measure to use as a control would be a combination of MRT and OLMAT scores. Further, it was decided that a simple sum of raw scores on MRT and OLMAT would provide about as effective a control score as any other combination. This simple sum yields a weighting of MRT to OLMAT of about 1.5 to 1. Such a weighting is in the direction suggested by the relative correlation of MRT and OLMAT scores with the post-treatment Stanford test scores. Frequency distributions of MRT + OLMAT sum scores were prepared for each of Groups A, B, and C. The three groups were matched in five point intervals in the sum score. Then, since it was felt desirable to analyze the effect of the experimental treatments for pupils at differing initial ability levels, the three matched distributions were subdivided into three equal groups on the basis of MRT + OLMAT scores.

Table 1 summarizes the results of the matching, in terms of the pre-test scores. Although pupils were matched specifically in terms of the MRT + OLMAT sum scores, Table 1 also presents summaries of those two sets of scores separately.

Table I

Summary of Pre-test Scores for Sub-groups:
Means and Standard Deviations for MRT, OLMAT, and MRT + OLMAT

TREATMENT GROUPS:		A (348)		B (348)		C (348)	
READINESS ABILITY LEVEL	SCORES	M	SD	M	SD	M	SD
HIGH (348)		(116 cases)		(116 cases)		(116 cases)	
	MRT	75.4	5.4	74.7	5.6	74.3	6.3
	OLMAT	43.8	5.2	44.4	4.0	44.3	4.3
	MRT + OLMAT	119.2	7.3	119.1	7.4	118.7	7.4
MIDDLE (348)		(116 cases)		(116 cases)		(116 cases)	
	MRT	63.6	4.5	62.2	5.5	61.7	5.3
	OLMAT	36.6	4.4	38.2	3.9	38.4	4.3
	MRT + OLMAT	100.1	5.0	100.4	4.9	100.1	4.9
LOW (348)		(116 cases)		(116 cases)		(116 cases)	
	MRT	48.5	9.4	47.1	8.6	46.7	8.4
	OLMAT	28.9	6.1	30.1	6.3	30.6	6.0
	MRT + OLMAT	77.4	11.3	77.2	11.4	77.3	11.7
TOTAL = 1,044							

Performance of the three treatment groups as a whole and by level of pre-test (readiness-ability) was evaluated by means of analysis of variance techniques. Data for each of the six Stanford subtests was subjected to two-way analysis of variance (fixed effects model with replications within cells). Comparison of mean scores by treatment across and within levels was accomplished by way of the Newman-Keuls procedure. Raw scores were used for all analyses of Stanford Tests.

Results

The Visual-Linguistic Reading group (A) scored significantly higher than the control group (C) in five of the 45 subtests (Word Reading, Paragraph Meaning, Spelling, and Word Study Skills). The control group (C), on the other hand, scored significantly higher than the experimental group (A) in not a single one of the 45 subtests. Furthermore there was a slight numerical superiority in the tallies involving significant differences among the 45 subtests, a superiority favoring the experimental group (A) over the control group (B). In terms of total scores for each of the five subtests in all three ability groups, the Visual-Linguistic group (A) was significantly better than the basal control group (C) in all five, as revealed in Table 2.

Table 2

Summary of Order of Treatment Means and Significance of Differences Between Treatment Means Across and Within Levels *

Word Reading	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	B	C	A
Total	B	A	C

Paragraph Meaning	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	A	B	C
Total	A	B	C

Vocabulary	Best		Worst
High Ability	B	A	C
Middle Ability	B	A	C
Low Ability	B	A	C
Total	B	A	C

Spelling	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	A	B	C
Total	A	B	C

Word Study Skills	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	B	A	C
Total	A	B	C

(*Treatment or group designations are arranged from highest to lowest mean scores, going from left to right--from best to worst, that is. Treatment designations not sharing an underline are significantly different. For example, in Word Reading, group A has the highest mean score, B the next highest and C the worst. A and B are not significantly different but A and B are significantly higher than C.)

The revisions and changes made after the first year of testing were, from all appearances, already being reflected in the statistical evidence from the second test year. As before, the addition of a stronger visual dimension through use of an overhead projector was enough to make the results for group B significantly better than those for group C. This was so, even though the three different school systems each used different basal reading programs. Such findings add further weight to the importance of the visual element in a reading program. Despite the fact that the basal programs were for most of the teachers the program that they had most experience with, the new Visual-Linguistic approach got significantly better results even at the initial testing stage.

Teacher ratings as well as statistical findings for the second year reflect the changes made after the first test year.

As revealed in Table 3, the over-all ratings are noticeably higher.

Table 3

Summary of Comprehensive Teacher Ratings

	Better than Average	Average	Worse than Average	Not Answered
Initial ratings (1966-7)	53%	17%	23%	7%
Final ratings (1966-7) (Year-end revisions)	61%	24%	12%	3%
Final ratings (1967-8)	70%	18%	9%	3%

For a more specific example, take the teacher's manuals, the area receiving most attention in the end-of-the-year revisions. The teachers

were asked, "How would you evaluate the teacher's manuals for the Visual-Linguistic Series?" On the initial rating for the 1966-67 test year, no teacher rated the manuals superior, 11% rated them good, 7% rated them average, 30% poor, and 44% inferior, 8% not answering. By the end of that first year after using all the manuals, the ratings were somewhat better--0% superior, 5% good, 23% average, 54% poor, and 18% inferior. The extensive revisions led to greatly improved ratings for the second test year--37% superior, 32% good, 21% average, 5% poor, and 0% inferior, 5% not answering.

Data from the first two years of testing is now being used as a basis for further changes and revisions to make up the final edition. The linguistic strand is being carefully re-developed to tap more fully the important contributions linguistic science has to make to reading instructions, the visual strand being closely integrated with it for maximum effectiveness.

Summary

1. On the five subtests from the Stanford Achievement Test related to reading there was significant differences between treatments on all five on the totals for high, middle, and low ability students, the Visual-Linguistic being significantly better than the basal reading control treatment and better but not significantly so from the overhead control.

2. At the middle and low ability levels, differences tended to lack significance.

3. Results for the Visual-Linguistic program tended to exceed those for the overhead projector control.

4. The overhead projector control (B) tended to exceed the Visual-Linguistic (a) with the middle and lowest ability groups, but not significantly.